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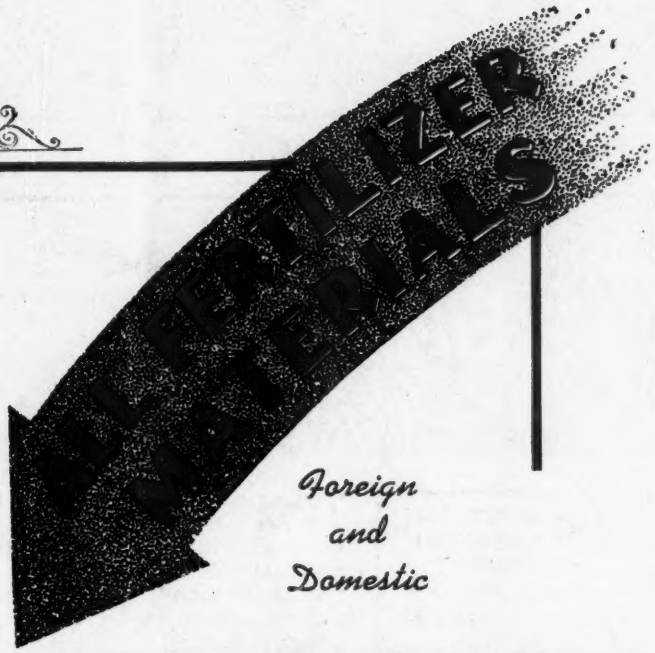

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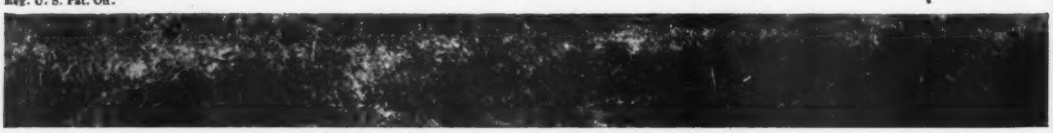

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See page 27

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Vol. 102 JANUARY 27, 1945 No. 2

What Outlook For Fertilizer Exports?*

By C. C. CONCANNON

Chief, Chemical Unit, Bureau of Foreign and Domestic Commerce

NO COUNTRY is more abundantly supplied with the basic fertilizer raw materials than the United States. Large phosphate-rock and sulphur reserves are in existence within its borders; facilities for the production of synthetic and by-product nitrogen are the greatest in the world; and there is potash sufficient for years to come. All these riches place the United States in the position of being not only the largest producer of fertilizers in the world, but they also offer it the opportunity of being the leading exporter. Fertilizer exports, however, from the United States have in the past represented but a small proportion of the amounts produced.

According to the Census report for 1939, the United States fertilizer industry, embracing establishments primarily engaged in the manufacture of commercial fertilizers and superphosphates or in the mixing of fertilizer materials, included 764 plants with an annual output valued in excess of $186,000,000. Additional fertilizer material is produced and delivered direct to the consumers and therefore does not pass through mixing plants.

United States Exports, by Value

Since 1929, the value of fertilizers and fertilizer materials exported from the United States has fluctuated greatly, from peaks of more than $20,000,000 in 1929 and 1940 to a low in 1933 of only $8,300,000. The annual average value of fertilizer exports during 1929 to 1939 was $14,600,000. In 1940 an appreciable increase occurred and value rose to $20,200,000, then declined to $19,100,000 in 1941, and $14,800,000 in 1942. Almost every country in the world at one time or another has taken United States fertilizers. Some countries have been consistent consumers of small quantities, the use of which deserves investigation to learn the purpose and the results obtained.

It is logical to assume that methods adopted in the United States for broadening fertilizer consumption should bring favorable results in export markets, and that the future annual volume of fertilizer exports should exceed peak levels of the past. A Department of Commerce publication, *Foreign Trade After the War*, suggests that the postwar value of fertilizer exports might be in the order of $24,000,000 annually, and that the total volume of all United States exports may approximate $7,000,000,000 annually, provided the United States purchases of foreign goods, services, and investments are large enough to support an export trade of such magnitude. These figures are, however, only mechanical projections of past relationships, and the annual value of fertilizer exports, in particular, might well be higher if American producers seek to develop their foreign outlets.

World Consumption

The United States has been the world's largest consumer of fertilizers, and during the current war period its consumption has expanded far more than in any other country. In 1942, United States consumption was slightly in excess of 10,000,000 tons and in 1943 was estimated to have exceeded 11,500,-

*From an article in *Foreign Commerce Weekly*, December 30, 1944.

000 tons. Recent consumption figures for other countries are not available, but it is doubtful if they approximate even the figures of 1936, shown in the following table. In the postwar period consumption is certain to increase greatly, especially in the fighting areas where food production has been low. The United States will be in a position to furnish a large proportion of this expanded world consumption.

An estimate of the total world consumption of fertilizers during the calendar year of 1936 was prepared by the First World Fertilizer Congress held in Rome. According to figures which may be regarded as fully authenticated and as accurate as the statistics at the disposal of authorities will permit, the world consumption of fertilizers in 1936 was 41,929,500 metric tons apportioned as shown in the following table.

WORLD CONSUMPTION OF FERTILIZER, 1936

Fertilizer Material	Total Quantity of Fertilizer Product	Quantity Consisting of Plant Food
	Metric Tons	Metric Tons
Nitrogen, Total	12,013,000	2,214,000
Ammonium Sulphate[1]	5,257,000	1,083,000
Chile Nitrate	1,403,000	221,000
Calcium Cyanamide	1,340,000	268,000
Other Synthetic Nitrogenous Fertilizers	4,013,000	642,000
Phosphoric Acid, Total	22,855,000	4,052,750
Superphosphate	15,700,000	2,669,000
Basic Slag	5,000,000	800,000
Ground Phosphates	1,000,000	285,000
Bones and Organics	350,000	105,000
Guano	250,000	32,500
Treated Phosphates	250,000	71,250
Concentrates — Phosphate Rock (at 29.5 per cent)	305,000	90,000
Potash (all products)	7,061,500	2,295,000
Grand Total	41,929,500	8,561,750

[1] Includes ammonia for mixed fertilizers.

The 41,929,500 tons of fertilizer consumed by the world contained 8,561,750 tons of pure plant food. Of the total tonnage consumed, 28.65 per cent was nitrogenous, 54.51 phosphatic, and 16.84 potassic. The estimated cost to the farmers was approximately $950,000,000.

Fertilizer Materials, United States

The world supply of fertilizers is dependent on three basic elements—phosphorus, nitrogen, and potash. Source materials for all these are readily available in the United States for shipment to world-consuming markets. Many of the largest plants are located on deep water where they have their own wharves with adequate and up-to-date loading facilities. Or, as exists in the Florida phosphate-rock section, a district is serviced by the railroads which transport the products in cars especially built for loading full cargoes on short notice to avoid demurrage. No better facilities for export could possibly exist.

Phosphates

The United States has been a major factor in the world supply of phosphates for many years, having furnished in 1937, for example, 13 per cent of the world's consumption outside of its own. The world fertilizer industry is dependent on three primary sources for its phosphate supply—phosphate rock, basic slag, and bones. Of these, phosphate rock leads in importance, and supplies are available in practically unlimited quantities, with deposits widely distributed throughout the world. Comparatively small quantities of bone are available for fertilizer use. Basic slag, although limited by the production of steel of which it is a by-product, is available in great quantity in some countries, particularly European. Most of the phosphate rock is processed to superphosphate to increase its solubility and availability as a plant food. In the preparation of basic slag and bone for use, they may be pulverized to a powder or meal.

United States phosphate-rock exports have averaged $5,100,000 annually since 1929. Other phosphate exports including superphosphates, but excluding mixtures or compounds with nitrogen, have approximated since 1929, $1,200,000 annually, sent to an average of 39 countries.

To supply those countries of the world which have not their own facilities for converting phosphate rock to superphosphate, United States plants and raw materials are economically and geographically well located. Sulphuric acid is necessary to produce superphosphate, and abundant United States sulphur deposits are available by water transportation to port producers of fertilizers. Most of the sulphur produced in the United States and all the pyrites are converted to sulphuric acid. The fertilizer industry is the largest consumer of the acid, and sulphuric plants are integral parts of most of the fertilizer plants located on the coasts of the

(Continued on page 28)

Lime Is The Key To Potash Efficiency*

By S. S. OBENSHAIN AND P. T. GISH

Department of Agronomy, Agricultural Experiment Station, Blacksburg, Va.

THE oft-repeated saying of Professor T. B. Hutcheson of the Virginia Agricultural Experiment Station that "the only thing a farmer has to sell is plant food" leads to the conclusion that the most efficient user of plant food should be the most successful farmer. While passing through the early years of the war food production program when there was so much discussion about a scarcity of potash, the natural thing to do was to search for more efficient ways of using potash. A study of experimental data in Virginia indicates that in practically every case, consistently greater yields from the use of potash alone and in combination with nitrogen and phosphoric acid have been obtained when the soil was adequately limed. The most striking of such data are taken from an experiment carried on at Staunton, Va., on a soil mapped as Berks silt loam. Soils of this and closely related series are among the most extensive soils in the limestone valley of Virginia and extend through West Virginia and Maryland into Pennsylvania. Similar results can be expected on many of the other soils of the Southeast, but the degree of response will vary.

The experiment described herein was carried on in a three-year rotation of corn, wheat, and red clover, each crop being grown every year in adjacent series of plots. The results are given in Table I. Each of the plots on which various combinations of nitrogen, phosphoric acid, and potash were used was divided into two sub-plots, one of which received lime while the other remained unlimed. Yields were therefore taken on each sub-plot. The rate of liming was two tons of ground limestone every six years of the experiment, but the limed sub-plots had received two tons of lime every three years previous to the experiment. The pH of the limed sub-plots varied from 6.5 to 7.8, while that of the unlimed varied from 4.4 to 5.8. The nitrogen was applied as urea, the phosphoric acid as 16 per cent superphosphate, and the potash as muriate of potash.

Since the farmer is more interested in the economy of the use of fertilizer and lime than in the actual increase in bushels and tons, calculations were made to determine the increased values of the crops produced when lime and various fertilizer materials were used. These calulations are based on prices assumed to be about average for the period of the experiment, prices decidedly different from those at present. A similar interpretation can be worked out for any specific price

TABLE I

THE EFFECT OF NITROGEN, PHOSPHORIC ACID, AND POTASH WITH AND WITHOUT LIME ON THE YIELD OF CORN, WHEAT, AND RED CLOVER ON BERKS SILT LOAM. 1935–1940.

Fertilizer Treatment[1]	Corn Average Yield Bushel Per Acre		Wheat Average Yield Bushel Per Acre		Clover Average Yield Pounds Per Acre	
	Unlimed	Limed	Unlimed	Limed	Unlimed	Limed
O	11.57	21.14	5.67	13.44	604	1,379
P	20.63	27.44	13.73	21.64	1,050	2,279
P-K	25.64	40.79	14.03	24.21	1,187	2,569
N-P	23.60	29.19	15.38	21.72	1,210	2,408
N-P-K	30.60	47.14	16.78	24.31	1,477	2,989
N-P-2K	36.31	48.56	19.24	25.80	1,822	3,263
N-P-3K	38.40	48.81	20.26	27.16	1,750	3,348
N-2P-K	36.44	46.45	20.28	27.82	1,777	3,218
N-2P-2K	37.62	50.44	21.55	27.76	1,783	3,365
N-K	17.46	37.65	8.96	16.65	1,035	2,382
2N-2K	21.16	43.45	9.22	20.81	1,198	2,702

[1]O–No treatment; N–20 pounds of nitrogen per acre annually; P–32 pounds P_2O_5 per acre annually; K–20 pounds K_2O per acre annually.

*Reprinted from *Better Crops with Plant Food.*

relationship by changing the values for both the crops harvested and the fertilizer used. As the prices for crops increase in relation to the prices of fertilizer and lime, the value of crop over cost of treatment will increase, and the reverse is also true. At present price levels, the returns would be much more favorable than is indicated by these interpretations, since the farm prices of the crops grown are practically double those used in these calculations, while the cost of the fertilizer and lime has advanced less than 25 per cent.

The values used for the financial interpretation were as follows: corn $0.75 per bushel, wheat $1.00 per bushel, clover hay $15.00 per ton, nitrogen $1.50 per unit, phosphoric acid $1.00 per unit, potash $0.80 per unit, and lime $3.00 per ton of ground limestone. This evaluation does not take into consideration the added production of straw or corn stover, nor does it consider the increased value of the crops produced with added fertilizer and lime. There the difference would be more striking than indicated in the discussion. This is particularly true with hay, since the plots receiving lime gave good quality clover hay in comparison to much less hay of a very inferior quality where lime was not used.

The results given in Table I are strong evidence in favor of the use of fertilizers, since the largest yields came from the heaviest application of a complete fertilizer; but even stronger is the evidence that for greater yields and for greater profits these fertilizers cannot be used without lime.

Results on Corn and Wheat

In the case of the corn yields, the phosphoric acid alone gave an increase of approximately 9 bushels per acre. Potash in addition to phosphoric acid gave an increase of approximately 5 bushels on the unlimed plots, and 13 bushels where lime also was used. The nitrogen used in addition to the phosphoric acid was not as effective as the potash in increasing the yield of corn, but the greatest yields were obtained from the use of a complete fertilizer. This increase was also sufficient to give a good profit after paying the added cost of the fertilizer. The addition of potash to the nitrogen and phosphoric acid on the unlimed plots gave an increase of approximately 7 bushels of corn per acre. Where lime was used, the increase was approximately 18 bushels per acre. For the 11 treatments, the average increase per acre for the limed half of each treatment over the unlimed half was 13 bushels. The highest yield on the unlimed series of plots was from the N-P-3K treatment, which also gave the greatest value of crop over cost of treatment. However, by the addition of about $1.00 worth of lime, the value of the crop was increased by approximately $7.75.

In the case of wheat, phosphoric acid increased the yield over check by approximately 8 bushels. The addition of potash increased the yield over the phosphoric acid by only .3 of a bushel per acre. However, the addition of lime to the P-K treatment gave an increase of over 10 bushels of wheat. As with corn, the greatest yields of wheat both on the limed and unlimed half came from a complete fertilizer. On the unlimed half of the plots, this difference was more than enough to pay for the extra cost of fertilizer. On the limed half, only the N-2P-K treatment gave an increase over the P-K treatment large enough to pay for the extra cost of fertilizer based on the average values given below. For the 11 treatments, the limed half yielded approximately 7¾ bushels per acre more than the unlimed half. At present prices, this would give well over 1000 per cent on investment.

Results on Hay

The clover hay on the unlimed half of the plot gave the greatest yield from the N-P-2K treatment and from the N-2P-2K on the limed half. Based on the figures given above, the N-P-2K gave the greatest return over cost of treatment, with the limed half giving approximately $10.00 worth of hay for $1.00 investment in lime. The 11 treatments gave an average yield of 1,354 pounds of hay per acre on the unlimed half; the limed half gave 2,718 pounds, or just over twice as much. It is also interesting to note that for each treatment the limed half gave a yield approximately twice that of the unlimed half. The above interpretation of results does not give due credit to the use of fertilizer and lime at present for two reasons. First, the price of hay is approximately double that used for the above calculations and also due to the fact that the quality of the hay is much better on the fertilized and limed plots.

The only treatment which did not give sufficient increase in yield to pay for the cost of fertilizer, based on the above values, was 2N.2K where used on wheat and hay. However, the use of lime in addition to the 2N.2K gave approximately $10.00 increase in value above the cost of the lime. The complete fertilizer gave best returns in yields, and also in value over cost of fertilizer in

(Continued on page 26)

IT MAY BE

By SAMUEL L. VEITCH

Drafting Farm Workers

It would seem General Hershey has found himself on a merry-go-round. It's like this, he sent word to draft boards in early January, which farm congressmen feel caused the boards to ignore the Tydings Amendment. Almost immediately, at the insistence of House Agricultural Committee, he wired the draft boards to observe the Tydings Amendment. Then in quick succession he gave the House Agriculture Committee the impression the Army doesn't think the Tydings Amendment means go easy on farmers. He further states to them, it's a matter of "comparative essentiality" and of course this line of thinking has the endorsement of the Army, who feel soldiers more essential than farmers. (Think I'll grab for the brass ring the next time we go around.

Union Raid

An attempted raid by Dan Tobin's Teamster's Union on a New Jersey dairy farm to "capture" employees for Union membership aroused farm leaders to a fighting pitch last week. The Union refused to handle Walker-Gordon farm milk because milking machine operators were not Union Members. The farm cries of alarm spurred Senators Hawkes of New Jersey and Aiken of Vermont to rush to the Agriculture Committee to "ascertain among other things whether the present laws are adequate to permit the War Food Administration to take any and all action that may be necessary to prevent waste and spoilage in the production, transportation and distribution of dairy products." The Union contended that milking machine operators were industrial employees rather than agricultural. (There's no telling what some guys wont do to muscle in their racket to pick up a few dollars.) To quote Senator Aiken:

"If operators of milking machines on farms are adjudged to be industrial employees, then operators of other machines, such as combines, mechanical cotton pickers and orchard sprayers could also be classified as industrial employees."

Taxes

To help small business, excess prifits tax may be upped to $25,000.00 for 1945. A higher rate of depreciation may be allowed, possibly one third of the cost in the year purchase is made.

"On to Tokyo"

"On to Tokyo is a caption we all have seen many times recently. No doubt, it wont be a simple matter. Some opinion holds it will take a "year or more" to do the job, but on the other hand no one would be surprised to see these little yellow rascals run for cover when Germany folds up. It may be, their "yellow streak" will show in their asking for a peace with reasonable terms. Their "reasonable terms" may run something like this, "We will give up, but let us have certain parts of China and don't bear down too hard on us, so we can come back at some future date to pull more of those "below the belt" sneak attacks." Nice boys these "made in Japan."

Secretary of Agriculture

It may be Murray Lincoln, Ohio Farm Bureau Federation head, is being considered as a successor to Agriculture Secretary Wickard. Lincoln at Columbus, Ohio, said he has not been offered the job and furthermore, before he would accept, he would want to be assured of the cooperation of farm organization leaders. (If it's promises Mr. Lincoln wants, he shouldn't have any trouble—seems you can gather a hat-full of them on every street corner, an once in a while in the middle of the block.)

Lincoln last year turned down the berth of Assistant Secretary of Agricluture, after taking a couple of days to think it over. It was rumored, Wickard would resign after election, but recently it had been generally assumed he would stay.

Machinery

The hesitation waltz WPB is putting on in releasing figures on farm machinery production is very upsetting to WFA and throwing a lot of others into a tail-spin. The breakdown of percentage figures by types of equipment for the last half of 1944 was compiled several weeks ago. Some WFA top-fighters took one look and got the heebie-jeebies. The figures show very little improvement over earlier twenty per cent to fifty per cent lag, (averaging about twenty-five per cent) was made during the last quarter of 1944. Planting equipment fell eighteen per cent, plows and similar tools thirty-four per cent, wheel tractors scheduled at 150,000 compared with 180,000 last year, were only slightly behind schedule.

Hecker Elected President of Chemical Construction Corp.

Arthur E. Hecker, formerly vice-president and general manager of Chemical Construction Corporation, has been elected president to succeed the late W. S. Stowell. Mr. Hecker was a captain in the U. S. Army Ordnance Department during World War I, and subsequently one of the principal engineers of Nitrogen Engineering Corporation whose synthetic nitrogen fixation processes were transferred to Chemical Construction Corporation in 1934. For many years prior to the present war, he was in charge of the European engineering offices of these companies.

Blakeslee Barnes, a vice-president of Chemical Construction Corporation, has assumed the additional duties of general manager. R. E. Lapean and S. F. Spangler have been elected vice-presidents of the company.

Crop Production Goals for 1945

Final agricultural production goals for 1945, as announced by War Food Administrator Marvin Jones, call for continued full production. The final national goals represent the total of State goals recommended by farmers, farm leaders, and State agricultural officials.

Crop acreage goals call for production above the high levels of 1944. For flaxseed, sugar beets, and cover crop seeds, the goals have been materially increased over 1944. Moderate increases over 1944 acreage are shown for dry beans, potatoes, and tobacco. The goals for legume hay seeds and for soybeans are maintained at the record 1944 levels.

The crop goals for 1945 involve some shift in the pattern of production in line with the changing demand situation. Total crop acreage of 363,635,000 in the final goals is approximately the same as recommended in the preliminary goals and nearly 3 per cent larger than 1944 planted acreage.

In announcing the 1945 production program, War Food Administrator Marvin Jones said: "The production goals will serve as a guide for farmers for another year in which food production will be just as important to the war as it was in 1944. We are again asking for all-out production. I realize that farmers will be faced with the task of overcoming many wartime production difficulties, including labor, machinery, and supplies, but, barring adverse weather, I am confident that the year 1945 will be another one of splendid farm achievement."

Crop and livestock goals for 1945 with comparisons follow:

FINAL CROP GOALS
1945 ACREAGES, WITH COMPARISONS

Commodity	1944 (Dec.) Planted	1945 Goal WFA Suggested Acreage (Thousands)	1945 Goal State Recommended Acreage (Thousands)
Food and Fiber Crops:			
Wheat (net planted except '35–'39)	65,454	67,640	67,731
Rye[1]	2,254	2,406	[2]2,515
Rice	1,482	1,400	1,405
Dry Beans	2,228	2,340	2,277
Dry Peas	727	450	[3]457
Soybeans for Beans[1]	10,502	10,688	10,757
Flaxseed	3,052	5,000	5,000
Peanuts, grown alone	4,012	4,000	3,955
Peanuts, picked and threshed[1]	(3,212)	(3,300)	(3,230)
Cotton	20,356	20,472	20,507
Broomcorn	401	370	[3]370
Sugar Beets	639	951	951
Sugar Cane (except sirup)[1]	295	337	337
Potatoes	3,010	3,100	3,137
Sweet Potatoes	777	829	841
Truck Crops			
Fresh[1]	1,873	1,683	[4]
Processing	2,051	[7]2,010	[4]
Tobacco[1]			
Flue-Cured	1,007.3	1,023.1	1,042.3
Burley	472.7	479.7	502.7
Other Domestic	231.6	264.0	257.8
Feed Crops			
Corn	98,722	99,606	99,098
Oats	42,983	44,023	44,259
Barley	14,300	14,483	13,911
All Sorghums (except sirup)	18,017	16,740	17,155
Total Cultivated Crops	294,847	300,295	300,304
Hay and Hay Seeds[1]			
All Tame Hay	59,547	62,838	62,862
Hay Seeds—Legume[5]	4,783	4,746	4,899
Cover Crop Seeds[6]	330	483	[2]469
Grand Total (excluding Hay Seeds)	354,724	363,616	363,635

[1] Harvested.
[2] Goal announced fall, 1944.
[3] WFA suggested goal for Oklahoma included in total.
[4] Goals not established on a State basis. WFA suggested goals included in totals.
[5] Includes alfalfa, red, alsike, sweet and Ladino clover, and Lespedeza.
[6] Includes hairy vetch, common and Willamette vetch, Austrian winter peas, crimson clover, and common ryegrass.
[7] Revised upward to 2,155,000 acres. Increased military needs will necessitate output at maximum capacity of processing plants.

Tax Tag Sales for 1944

Fertilizer tax tag sales in the 17 reporting States were slightly smaller in 1944 than in 1943, making the first time in six years that a decline had occurred.

Fertilizer consumption in these 17 States accounts for two-thirds of total consumption in the United States. Tag sales and total United States consumption in the past have always moved in the same direction. The decline in tag sales should not be taken to mean, however, that there was less fertilizer used in this country in 1944 than in 1943. Perhaps it is true that figures don't lie, but it is also true that statistics without any analysis can be misleading.

The successful movement in recent years to get farmers to buy their fertilizer early, a necessary and most desirable plan, has disturbed the statistical picture. The change in buying has greatly changed the seasonal distribution of tag sales. In 1936–1940 sales in July–December accounted for only 16 per cent of the total year's sales; in 1944 the proportion was 29 per cent. Most of the tags sold in October, November, and December represent fertilizer tonnage used in the following year.

Tag sales in the fertilizer year, July through June, are now much more significant than are calendar year figures. Tag sales in the year ended June 30, 1944, were 850,000 tons larger than in the preceding year. Sales in the last half of 1944 were 55,000 tons larger than in the corresponding period of 1943.

Examination of the tag sale figures indicates that total fertilizer consumption rose moderately in 1944, to a new all-time high.

Five of the 12 Southern States and four of the Midwestern States reported larger tag sales in 1944 than in 1943, but the effect of these increases was offset by declines in the other eight States. In at least one State actual shipments in the last six months of 1944 far exceeded tag sales in the same period.

Ter Horst Appointed V-C Research Head

The Virginia-Carolina Chemical Corporation has announced the appointment of W. P. ter Horst as manager of Research and Development. He will make his headquarters at the company's research offices at the Carteret, N. J., plant. Mr. ter Horst was formerly with the U. S. Rubber Company, having been head of the organic chemistry department at the company's general laboratories at Passaic, N. J.

ANNUAL FERTILIZER TAX TAG SALES

By Tons

State	1939	1940	1941	1942	1943	1944
Virginia	418,089	393,069	399,377	420,668	487,038	515,578
North Carolina	1,215,887	1,076,730	1,150,343	1,243,612	1,414,454	1,369,751
South Carolina	678,859	685,310	729,447	698,704	890,493	799,083
Georgia	689,790	762,725	806,326	852,765	1,083,488	1,039,679
Florida	556,782	568,671	654,664	650,577	804,303	899,425
Alabama	562,100	575,900	581,500	574,150	780,050	674,400
Mississippi	318,761	319,508	368,667	377,082	495,239	417,624
Tennessee	130,354	147,311	141,461	174,298	230,818	271,545
Arkansas	74,122	101,000	125,100	140,458	182,865	131,083
Louisiana	160,488	156,775	182,010	173,241	214,768	216,245
Texas	95,226	118,199	142,666	133,974	186,510	204,509
Oklahoma	7,622	7,363	12,950	8,752	21,488	20,708
Total South	4,908,080	4,912,561	5,294,511	5,448,281	6,791,514	6,559,630
Indiana	263,145	302,750	340,161	436,679	496,380	480,421
Illinois	43,456	51,748	63,004	82,526	111,315	185,565
Kentucky	120,009	123,102	121,976	146,420	164,037	246,119
Missouri	67,733	87,577	86,964	70,937	95,592	146,504
Kansas	14,366	17,931	19,186	11,415	16,324	38,521
Total Midwest	508,709	583,108	631,291	747,977	883,648	1,097,130
Grand Total	5,416,789	5,495,669	5,925,802	6,196,258	7,675,162	7,656,760
Total U. S. Fertilizer Consumption*	7,766,000	8,303,000	9,241,000	10,009,000	11,532,000	.....

*Including fertilizer distributed by Government agencies.

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Principal Articles in This Issue

WHAT OUTLOOK FOR FERTILIZER EXPORTS? 7

LIME IS THE KEY TO POTAZH EFFICIENCY.. 9

Tax Tag Sales for 1944..... 11

Crop Production Goals for 1945..... 12

IT MAY BE..... 13

Farmers' Purchasing Power Grows..... 14

Senate Study of Fertilizer Production Proposed..... 15

Fertilizer Produces Higher Nutrient Values 16

FERTILISER MATERIALS MARKET:
New York..... 17

Tennessee Phosphate..... 17

Chicago..... 19

Federal Potash Reserve Established..... 20

Farmers' Purchasing Power Grows

The cash income of the farmers of the United States in 1944 was more than twice that of 1940, according to economists of the National Fertilizer Association. But farm expenses have risen 36 per cent during the period, leaving the farmers' purchasing power that much short of doubling.

Studies were made of the farm income for the period of 1910–14—a period preceding large-scale use of farm tractors, the more efficient use of fertilizers, and other modern advances in cultural practices—and comparisons were made with production in 1944. The astounding facts are revealed that farm production has increased 45 per cent with 17 per cent fewer farm workers.

Chief among factors of increased production with less manpower are the tractors and other labor-saving machinery, the increased use of fertilizer, improved seed, and better cultural practices.

The part fertilizers have played is revealed by the fact there was a rise of two-thirds in fertilizer consumption during that period. Yet it is revealed that the cost of fertilizers and lime used on farms in 1943 was less than two cents of each dollar of the farmers' expense. Apparently the relative cost of fertilizers and lime in 1944 was not greater than in 1943 since there were no advances in prices of each.

Production of farm crops in 1945 is facing a serious decrease in farm labor. Unfortunately, labor-saving means and methods are not available to fully offset the labor loss. Even fertilizers do not promise to be up to production of 1944. As a means of offsetting labor loss, fertilizers offer greater and more profitable acre yields of crops at low cost. The United States Department of Agriculture says, "Fertilizers are considerably lower than prices of most commodities bought by farmers."

With such fertilizers as the farmer is able to buy, there should, of course, be their most efficient use as a labor-saving recourse. This means heavier fertilization of fewer acres, rather than lighter fertilization of more acres.

A record crop of peanuts, 2,336,865,000 pounds, is the estimate of the United States Department of Agriculture for 1944. This is 137,000,000 pounds more than the crop of 1943.

Senate Study of Fertilizer Production Proposed

Establishment of a subcommittee of the U. S. Senate Committee on Agriculture to keep in touch with developments in the field of fertilizer production and distribution is provided for in a resolution (S. Res. 42) introduced in the Senate January 22nd by Senator Elmer Thomas of Oklahoma, chairman of the committee.

Although the resolution provides for an investigation of the fertilizer industry, Senator Thomas said that no investigation is intended and he has introduced the resolution merely for the purpose of reestablishing the subcommittee that was in existence last year. This subcommittee, under the chairmanship of Senator Allen J. Ellender of Louisiana, concerned itself primarily with the ammonium nitrate situation and the complaints of farmers of their difficulty in handling the material.

The resolution states that the "committee on agriculture and forestry, or any duly authorized subcommittee thereof, is authorized and directed to make a full and complete study and investigation with respect to the supply, production, distribution, and sale of fertilizers for agricultural purposes. The committee shall report to the Senate at the earliest practicable date the results of such study and investigation, together with its recommendations for necessary legislation."

Advertising and Tax Base

The Supreme Court of the United States on January 15th held that Congress intended that advertising and selling expenses incurred by a manufacturer should be included in the tax base. "Regardless of whether we consider such expenses technically as manufacturing costs, it is obvious that they are incurred prior to the actual shipment of articles to wholesale purchasers and that they enter into the composition of the wholesale selling price," the Court stated. And added: "Even if the purchaser accepts delivery at the factory, he pays for the advertising and selling expenses. Thus they must be included in the taxable selling price."

The petitioner, a manufacturer of toilet articles, sought recovery of a portion of taxes paid because the tax authorities held that Congress intended in Section 619 (a) to exclude selling and advertising expenses from items which go to make up the manufacturer's price.

Flaxseed Bonus Voted

A program for increasing the production of flaxseed for making much needed linseed oil includes a farmer bonus of $5.00 per acre for all acres approved by the county AAA committee. Congress has appropriated $30,000,000 for incentive payments. A crop goal 64 per cent above 1944 acreage has been set, or a goal of 5,000,000 acres with which to provide 36,800,000 bushels of flaxseed needed along with 6,300,000 bushels of imports.

Sulphate of Potash Conversion Plans Canceled

Plans, which had been made by the Government for conversion of muriate of potash to sulphate of potash at the Rubber Reserve Plant at Louisville, Ky., have been abandoned after a breakdown. Apparently there is no relief to the shortage of sulphate of potash in sight. Tobacco growers are particularly concerned.

Obituary

Dr. William S. Myers

William Shields Myers, D.Sc., former director of the Educational Bureau of the Chilean Nitrate of Soda Producers in the United States, died January 10th in his home in Bainbridge, N. Y. He was seventy-eight years old.

Dr. Myers was born in Albany, N. Y. He was a graduate of Rutgers College and studied also in Munich, Berlin, and London. He was assistant chemist for the New Jersey Experiment Station, 1888 to 1889; chemist for Lister Chemical Works for a year after his return from London in 1892. In 1893, he became a member of the Rutgers Chemical faculty, remaining until 1901, when he began his association with the Chilean nitrate bureau. He retired from the directorship in 1926. Dr. Myers was a trustee of Rutgers from 1902 to 1906 and again from 1912. He was mayor of New Brunswick, N. J., from 1904 to 1906, and was a member of the Managing Commission of the New Jersey State College of Agriculture during the past twenty-four years. He founded the *Journal of Soil Science* and was the author of a number of books in the agricultural and social sciences.

Dr. Myers' survivors are his wife, Annie Lambert Myers, and a son, William Lambert Myers.

Fertilizer Produces Higher Nutrient Values

When nutrient values become commonly known, purchasers will not pay as much for food and feed grown on unfertilized soils, which return only 60 to 80 per cent as much value in growth and health, as they will pay for equal amounts of farm products grown on properly fertilized soils, predicted David D. Long, chief of feed and fertilizer research for International Minerals and Chemical Corporation, in a recent speech before the Chicago Agricultural Club.

Stressing the point that increased yields are only a small part of profitable farming, he said, "It is very probable that under postwar competitive farming conditions the farmer who makes those extra dollars which distinguish between profit and loss will be the one whose hay and feed grains have a higher nutritive value than the other farmer. The producer of canning crops who is able to sell his products will have products which carry better, hold up better and, when processed, will provide higher nutrient values."

He quoted the War Food Administration as estimating that it would take 16,560,000 tons of fertilizer for maximum crop production in the United States—approximately a third more than was produced in 1944 and about twice that produced in 1940. The fertilizer industry increased production from 8.3 million tons in 1940 to 11.5 million tons in 1943, and 1944 tonnage is estimated to be from 11.5 million to 12 million tons.

"In attaining this increased production," Mr. Long commented, "the industry had the usual headaches of shortages in labor, transportation, supplies and other facilities. No special compensations or subsidies by the Government contributed to the increase.

"Ordnance changes during the latter part of 1944 required increased quantities of sulphuric acid, which is essential in the manufacture of superphosphate. Fertilizer manufacturers are in hopes that the expected supply of sulphuric acid is only delayed, but not too delayed for manufacturing the fertilizers needed for the 1945 crops," he continued.

"WFA places the superphosphate 'in sight' at 7 million tons. It was anticipated at an earlier date that the industry would supply approximately 7.5 million tons or more of superphosphate. While this is about 7.1 per cent less than hoped for, it is nevertheless over 66 per cent more than produced in the 1935–1939 period.

"This lack of sufficient superphosphate is spoken of as a shortage. However, with an increased production of over 3 million tons of fertilizer since Pearl Harbor, shortage in the fertilizer situation must be construed as a shortage in relation to wartime needs and not to prewar production. The shortage of the desired amount of superphosphate for 1945 crop production purposes means, in terms of mixed fertilizers, approximately 900,000 tons—equivalent to the amount of fertilizer reported used in the States of Ohio and Indiana in 1943.

"Supplies of nitrogen for fertilizer purposes regarded as certain are 588,000 tons. This is 43,000 tons less than was used for fertilizer purposes last year but 220,000 tons more than the average consumption in the 1935-1939 period.

"Potash supplies 'in sight' present a decided contrast to those of phosphate and nitrogen. There is an increased available supply over last year and over the prewar period. This is an achievement of the American potash producing industry which will go down in history as an example of American ingenuity and enterprise unaided by subsidies," Mr. Long concluded.

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FERTILIZER MATERIALS MARKET

NEW YORK

Sulphate of Ammonia Supply Seems Adequate with Added Demand as Replacement for Nitrogen Solutions. Organics Still Limited in Supply. No Improvement in Superphosphate Situation. Sulphate of Potash in Short Supply.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, JANUARY 24, 1945.

Sulphate of Ammonia

It is reported that WPB has granted all January requests in full in the eastern section. The continued scarcity of nitrogen solutions has caused many fertilizer manufacturers to seek additional sulphate of ammonia to supply the nitrogen needed in their production.

Nitrate of Soda

The January prices on domestic nitrate of soda have been continued during February. The demand continues at top levels, particularly from farmers who are laying in supplies for top dressing later in the crop season.

Organics

Lack of imports of the principal organic ammoniates has thrown the burden of supply on domestic production. Almost all the recent purchases have been by feed manufacturers who can pay the ceiling prices that are above the fertilizer range. In spite of this, some fertilizer manufacturers are taking supplies where they can be obtained.

Superphosphate

The superphosphate situation has shown no signs of improvement. A continued shortage of sulphuric acid and a shortage of manpower are making it impossible for producers to fill the orders which have accumulated from fertilizer mixers. Some superphosphate plants are especially anxious about the new draft program which would further curtail the labor supply.

Phosphate Rock

Most superphosphate producers are able to get as much rock as they can acidulate under present conditions. Some of the higher grades of rock are sold up, with orders accumulating. A relatively small amount of foreign rock has come in as ballast and this has been sold at somewhat less than ceiling prices.

Potash

Ample supplies of muriate of potash are reported in all fertilizer manufacturing sections. Some concern is being felt in tobacco growing sections over the short supply of sulphate of potash and the market on this material is tight, with no immediate signs of improvement.

TENNESSEE PHOSPHATE

Shipments of Rock to All Channels Continue at Peak Levels. Larger Allotments for Direct Application in 1945.

Exclusive Correspondence to "The American Fertilizer"

COLUMBIA, TENN., January 22, 1945.

Shipments of phosphate rock of all grades and types into all the different channels of consumption, including the three large electric furnaces at Columbia, Mt. Pleasant and Muscle Shoals, are moving at the greatest rapidity possible with the manpower available. Even the farmers, who for the past fifteen years have been very choosy about just what time they accepted shipments and insistent upon getting 95 per cent of the ground rock they have been using in 100-pound bags, to avoid the troublesome and disagreeable handling in bulk, are more and more coming to the realization that the best time to accept shipment is when they can get it, and that bulk shipments, which permit 50 per cent greater tonnage with same manpower, are not so bad after all.

Quota allotments to the several districts of the various producers have been announced for 1945 to the district men, and they are busily engaged in dividing it out to best advantage of all consumers in their districts. The production in 1944, which was by far the

"I'm going to keep right on working until that boy gets home again.

"Sure, I'm too old to work, but some folks are buying a lot more War Bonds than I can afford to buy, others are giving blood, thousands are producing war materials . . . so I just figured I'd do all I could to keep the farm a goin' as they tell me food will win the war, hasten Victory and bring that boy home again."

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largest amount for direct application yet supplied, will be at least 10 or 15 per cent larger in 1945, unless more bad luck crops up to disappoint expectations. AAA is endeavoring to distribute a much larger amount of ground rock especially to Illinois and Kentucky where it is supplied by them on Grants of Aid basis, their tonnage coming entirely from Florida mines, as the entire capacity of Tennessee mills is more than covered by orders placed through regular commercial channels.

A very peculiar situation exists as to delivered prices being paid by consumers as unofficially reported, with no definite confirmation. AAA is reported as selling Florida 32 per cent rock delivered at $14.80, delivered all stations, with freight rates varying from $6.34 to $10.40 and the Florida miners' ceiling of $6.00. With commercial dealers' ceiling at $11.25, f. o. b. mines, the delivered price through dealers runs from $17.59 to $21.65, yet consumers are apparently taking all they can get at either price level. Of course the dealer differential is absorbed by the AAA at the expense of United States taxpayers.

It is estimated that over 250,000 tons of ground rock will go into Illinois, Indiana and Kentucky in 1945, with a considerable but, of course, much smaller amount going into all other States.

Customers and dealers who, during the past twenty years took from one to five carloads each year, now want from 20 t0 25 carloads each season, and it is hard for them to understand why it cannot be furnished. For so many years sellers of ground rock always had phosphate they could not sell and were ardent seekers for orders.

CHICAGO

Fertilizer Organics Supply Still Inadequate for Demands. Feed Organics Demand Improves.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, January 22, 1945.

The tight supply situation in the organic market continues, supplies being insufficient to fill the demand. Offerings of material for nearby deliveries are practically non-existent at this time.

The feed demand has improved somewhat, and all materials are holding close to ceiling prices.

Ceiling prices are:

High grade ground fertilizer tankage, $3.85 to $4.00 ($4.68 to $4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, $5.53 per unit ammonia ($6.72 per unit N); blood, $5.53 ($6.72 per unit N); dry rendered tankage, $1.25 per unit of protein, f. o. b. producing points.

Exchange of Sulphate of Ammonia for Uramon

On July 6, 1944, the War Production Board notified all fertilizer manufacturers east of the Rockies that sulphate of ammonia previously assigned to them for mixing purposes might be exchanged for uramon for mixing purposes, on a basis of 2 tons of sulphate of ammonia for 1 ton of uramon, so far as the uramon supply might permit. WPB now advises that some uramon is now available, for shipment from February forward, for exchange on the same basis for sulphate of ammonia. Manufacturers east of the Rockies may request such an exchange as to all their unordered allocations of sulphate of ammonia.

Manufacturers' Sales Agents for **DOMESTIC**

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Tankcar Daily Records Required

Acidulators in the fertilizer industry can be assured that the Office of Defense Transportation is keeping close check on tankcars. Beginning January 22nd, ODT required daily telegraphic reports from shippers and carriers on the location and status of empty tankcars.

The information required includes the number of loaded tankcars, number of unbilled loaded tankcars or tracks owned or leased by the producer, number of empty tankcars held on such tracks, excluding cars in bad order and number of bad-order cars on hand that are slated for repair work at repair shops.

Nitrogen Important for Apple Trees

"Nitrogen's record for increasing yields in the apple orchard is good enough for any apple grower. Plentiful applications in 1945 are in order," so states A. H. Teske, horticulturist for the Virginia Agricultural Extension Service, in urging growers to make nitrogen the basis for their apple orchard feeding program this year. After all, nitrogen is the most important requirement for getting high annual yields.

Growers will want to do everything they can to boost yields this year since the 1945 crop is expected to be smaller than in 1944. Not only will nitrogen help produce more apples this year but it will help get the trees away from alternate bearing, Teske believes.

In 1945, nitrogen is especially important because many trees were weakened by the heavy crop of last summer and by the dry weather. Nitrogen will help bring these trees back to normal vigor. Because of the heavy drain on the trees, they did not form as many strong fruit buds this past year. A good set of fruit from the buds we have encourages annual bearing—so here again nitrogen can help out.

Nitrogen also means a lot for good terminal growth, large and dark green foliage. Since large, dark green leaves mean more and bigger apples, there's just another reason for using this fertilizer.

Federal Potash Reserve Established

Secretary of the Interior Ickes has announced the establishment of a potash reserve in southeastern Utah, through the vacating of Public Land Order No. 130. Under the revised regulations the total acreage held by any permittee or lessee may not exceed 15,360 acres. All assignments of leases and permits must be approved by the secretary and shall be filed within 90 days from the date of execution and the consideration paid for the assignment must be shown.

Other salient points at which the revised regulations differ from those hitherto in effect are:

Royalties for the production of potash under lease of the public domain shall be paid in cash or delivered in kind at the option of the Government.

A royalty of 12½ per cent will be required on all potassium compounds and related products mined from the permit lands—as distinct from leased lands—and sold or otherwise disposed of or held for disposition.

A permit may be extended for an additional two-year term only if the permittee has drilled at least one adequate test well during the two-year period for which the permit was granted.

The regulations now provide that a lease

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shall be awarded to the applicant merely reserving to the secretary the right to offer the land for lease by competitive bidding. The revised regulations would reverse this procedure by providing for the sale of leases by competitive bidding in all cases.

Marvin Jones Asks for More Fertilizer Manpower

War Food Administrator Marvin Jones has written Chairman Paul V. McNutt of the War Manpower Commission to say: "We have reason to be concerned over the prospect that loss in production and inability to ship finished fertilizers, due to shortage of manpower, will adversely affect, and to a material degree, our crop goal program."

The letter continues to the effect that WMC had cooperated last year for which he was thankful and asks that the attention of WMC regional and local officers be again called to the urgent need in order that farmers may not lack fertilizers in their effort to achieve maxium crop production.

Cardon Appointed Administrator of Agricultural Research

The resignation of E. C. Auchter as administrator of Agricultural Research, effective February 3rd, and the appointment of the assistant administrator, P. V. Cardon, to succeed him is announced by U. S. Secretary of Agriculture Wickard. Dr. Auchter is resigning to become director of the Pineapple Research Institute of Hawaii, with headquarters at Honolulu.

In making the announcement, Secretary Wickard said: "I am accepting Dr. Auchter's resignation with the utmost regret. We could not have spared him if it were not for the effective work he has done in organizing the Agricultural Research Administration from the time it was created at the end of 1941. He has so ably directed and coordinated the research of the Department of Agriculture that we are in a position to build further on the remarkable record of achievements the Agricultural Research Administration has made under his leadership. With P. V. Cardon, a scientist of exceptionally broad training and experience, to take over as administrator, all of this work will be in capable hands and will go forward without interruption."

Before becoming assistant administrator of the Agricultural Research Administration early in 1942, P. V. Cardon had had thirty years' experience in conducting and directing scientific research. Born in Logan, Utah, in 1889, he graduated from Utah State College and then spent ten years, beginning in 1910, as agronomist in the Bureau of Plant Industry of the Department of Agriculture. In 1920 he went back to the Northwest for 15 years, first serving for a short time as professor of agronomy in Montana State College and then joining the staff of Utah State College, where he eventually became director of the State Agricultural Experiment Station, a position he held for seven years. During his final year in Utah he was regional director of the land policy section of the Agricultural Adjustment Agency. In 1935 he returned to the Bureau of Plant Industry to head the work in forage crops and diseases and four years later became assistant chief of the Bureau.

Marl and Limestone

"The purest marl does not have quite as high a neutralizing value for acid soils as the average dolomitic limestone," says Dr. Emerson Collins, in charge of extension agronomy at North Carolina State College. He also points out that the marl does not carry magnesium which is particularly needed in the Coastal Plain, the Sandhills, and on the heavier acid soils. A yield of 1½ bales of cotton per acre takes up 36 pounds of magnesium, and 30 bushels of soybeans take up about 40 pounds. Magnesium promotes the formation of oils and fats and acts as a carrier of phosphate in the plant.

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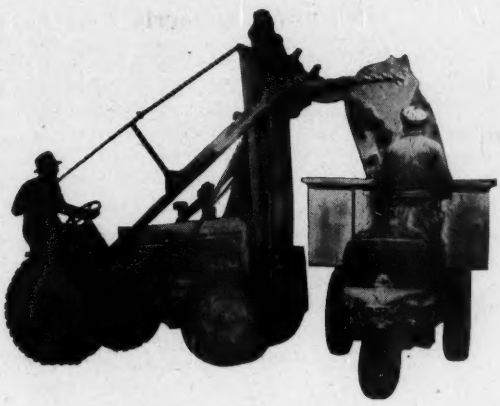

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68%—70%—72%—75%—77%

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66%—68%—72%

Superphosphate
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Domestic Potash Salts

All Standard Grades of Potash
Including SUL-PO-MAG

(Sulphate of Potash-Magnesia)

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CHEMICALS

International

MINERALS & CHEMICAL CORPORATION

General Offices • 20 North Wacker Drive • Chicago
Mining and Manufacturing

PHOSPHATE • POTASH • FERTILIZER • CHEMICALS

Personal Mention

Horace R. Graham of Santiago, Chile, for many years associated with the Guggenheim interests, has been elected chairman and president of Anglo-Chilean Nitrate Corporation and Lautaro Nitrate Company, Ltd., two of the large nitrate producers of Chile.

Dr. J. H. Stallings has been appointed to succeed Dr. A. G. McCall, retired, to head research in agronomy for the Soil Conservation Service, Washington, D. C.

L. A. Mullins has been appointed State administrator of the Agricultural Adjustment Agency of Louisiana, succeeding G. J. Durbin to enter business at Monroe, La.

Pierre S. du Pont, former president of E. I. du Pont de Nemours and Company, Wilmington, Del., was seventy-five years of age on January 15th. At present he is a director and member of the finance committee of the firm.

Tyrus R. Timm, extension economist in farm management at the Texas A. and M. College, has been appointed agricultural relations adviser for OPA in Washington, D. C. He succeeds H. H. Williamson who becomes assistant director of the Federal Extension Department, U. S. D. A.

Dr. Franklin S. Harris, president of Brigham Young University and formerly director of the Utah Agricultural Experiment Station, has been chosen president of the Utah Agricultural College effective July 1st. He will succeed Dr. E. G. Peterson who has served as president for the past twenty-eight years.

C. H. McDowell has been promoted from the position of vice-director of the Texas Agricultural Experiment Station to the position of director, succeeding A. B. Conner who resigned after twenty-four years' service as director.

T. W. Harris Joins Wilson and George Meyer & Company

Thomas W. Harris has joined the staff of Wilson and George Meyer & Company, assuming duties in the agricultural and industrial chemical department of the firm in the Los Angeles office, 402 Architects Building, 815 W. Fifth Street, on January 22nd.

An executive with Basic Magnesium, Inc., Las Vegas, Nev., until recently, Harris will assist T. H. Lathe, Los Angeles manager, in the operation of the agricultural and industrial chemical department.

Wilson and George Meyer & Company and its predecessors date back to pioneer days of 1850 in San Francisco. The firm has offices in San Francisco, Los Angeles, and Seattle, and represents manufacturers of potash salts, soda ash, saltcake; bone meals, superphosphate, agricultural manganese, agricultural zinc products, plastics, foundry coke and pig iron.

Seven States Broke Cotton Records in 1944

Cotton yields of seven States set new high records in 1944. For the cotton States as a whole, the average yield of lint cotton was 295 pounds per acre, about 23 pounds above the highest previous average. The States producing the highest average-acre yield in their history were Alabama, Arkansas, Georgia, Mississippi, North Carolina, and Virginia. Heavier than usual applications of fertilizers with higher than normal content of plant foods had an important part in the results. Improved cultural practices and planting of the better varieties on better lands also made valuable contributions to the results.

Fertilizers and lime, including that distributed by AAA and TVA, represented only 4 per cent of the operating expenses of farmers in 1943, according to *The Agricultural Situation* for October.

NITROGEN for a baby?

THE PROTEIN in a baby's "formula" is but a few steps advanced from the nitrogen you put in your fertilizer. Nitrogen-fed pastures, for instance, are better pastures—grass that is high in protein value will sustain more cows at higher milk-producing levels.

But nitrogen is indispensable in the manufacture of high explosives for the guns of war. These guns have an unbelievable appetite. Right now, they are consuming much of the nitrogen that normally goes into Du Pont Urea-Ammonia Liquors and "Uramon" Fertilizer Compound.

These carriers of Urea Nitrogen offer many benefits to manufacturer and grower alike. Now is the time to learn how to take full advantage of them—against the day when supplies are again ample.

Our field service men will be glad to consult with you. E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

DU PONT UREA-AMMONIA LIQUORS

URAMON*

FERTILIZER COMPOUND

*REG. U. S. PAT. OFF.

DU PONT BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

Government As Referee—Not Manager

P. O. Davis, Director of Agricultural Extension Service at the Alabama Polytechnic Institute, speaking before a convention of Louisiana farmers on the "Four Freedoms for Agriculture," stressed freedom to produce abundantly, adequate prices for farm products, freedom to enjoy comfortable homes, freedom from excessive prices of commodities the farmer buys. Concerning the place of the Government he said:

"Government should serve as a referee to see that all play the game fairly and by good rules; but Government should not assume the role of manager.

"All groups need to work together for a balanced domestic prosperity, plus international relationships on the basis of a two-way street. We must serve to be served, or trade for trade. Basically, the economic problems of other nations are the same as ours but we can all gain by sound cooperation.

"This will be essential to prevent another attack by a gangster nation; to prevent World War III."

LIME IS THE KEY TO POTASH EFFICIENCY

(Continued from page 10)

practically all cases. Next to the complete fertilizer came the P-K treatment.

The yields also showed that nitrogen in the fertilizer was relatively more effective in increasing yields on the unlimed plots than on the limed plots. This would be expected, since the clover which grew much more luxuriantly on the limed plots was effective in supplying a portion of the nitrogen needs of the corn and wheat. It is also equally evident that the increase in yield caused by potash in addition to the nitrogen and phosphorus was far greater where lime was used.

With apologies to Kipling, there are several "ifs" to the maximum returns from the use of lime. In the first place, lime must be used with fertilizers and not in place of them. In the case of nitrogen, liming frequently lessens the need for its application in the form of commercial fertilizer. Lime improves the condition of the soil, allowing legumes and micro-organisms to take from the air a large part of the nitrogen needed for production of the crops. Such is not the case with phosphoric acid and potash, which can come only from the fertilizer material added and from the supply in the soil. With an increased yield, the amount of phosphoric acid and potash removed from the soil increases proportionately. If this added amount removed by the increase in crop yield is not compensated for by increased applications to the soil, a depletion of the reserve supply in the soil takes place. Such a depletion of the reserve can be excused only in cases where phosphoric acid or potash cannot be obtained in adequate amounts, or where their price relationships are such that the increased value of the crops will not pay for the fertilizer added. If the reserves of phosphoric acid and potash are depleted when they are scarce or when the price relationship is unfavorable, then these reserves should be built up when they are plentiful and when price relationships are favorable.

Another one of the "ifs" in regard to the use of lime is that the effect of the lime on corn and small grain, grown in a rotation such as the one described here, is largely an indirect effect. In other words, the lime applied to the soil causes a great increase in the yield of clover. The benefit to the soil of the extra clover stubble and refuse added to the soil where the clover yields are great is responsible for the greater part of the increase in corn and wheat. Such increases are just as real as if they were direct, but one should recognize that such increases in the yields of wheat and corn from the use of lime would not be expected to occur where the lime was added for the first time just before the corn or wheat was seeded.

A very important rule in regard to liming is to lime according to the needs of the soil and the crop. No two soils have the identical lime requirement, nor do any two crops, so in the process of liming, both should be considered if lime is to play its part.

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Nitrogenous Materials

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Phosphate Rock

Bone Meals

Manganese Sulphate

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PEOPLES OFFICE BUILDING
Charleston, S. C.

Keyed SERVICE!

Fertilizer plants all over the country—large and small—state their needs and we meet them. Large stocks of seasoned materials and ample modern production facilities enable us to make prompt shipments.

TRIPLE SUPERPHOSPHATE

46 to 48% Available Phosphoric Acid

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We also manufacture
HIGH-GRADE SUPERPHOSPHATE

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U. S. Phosphoric Products
Division
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. . . . WHEN BORON IS NEEDED TO CORRECT A DEFICIENCY OF THIS IMPORTANT SECONDARY ELEMENT

Agricultural authorities have shown that a lack of Boron in the soil can result in deficiency diseases which seriously impair the yield and quality of crops.

When Boron deficiencies are found, follow the recommendations of local County Agents or State Experiment Stations.

Information and references available on request.

AMERICAN POTASH & CHEMICAL CORPORATION
122 East 42nd ST., NEW YORK CITY
Pioneer Producers of Muriate of Potash in America

See Page 4

WHAT OUTLOOK FOR FUTURE EXPORTS?

(Continued from page 8)

United States. Yearly average exports of superphosphate alone were $1,000,000 during the period 1929–41.

Nitrogen

The United States nitrogenous-fertilizer position has been somewhat different from that of the phosphatic. Before the development of the synthetic-nitrogen industry the country was dependent for its nitrogen requirements upon imports of Chilean nitrate. However, during the period between World War I and World War II, Germany became solidly entrenched as a leading exporter of synthetic nitrogenous fertilizer materials, and the United States also become prominent as an exporter.

Since 1941, the growth of the synthetic-nitrogen industry in the United States has been phenomenal. Estimated capacity is said to be three times what it was before the war and exceeding Germany's existing plants in 1941. Synthetic nitrogen is produced largely by the direct combination of nitrogen and hydrogen with ammonia. The nitrogen is obtained from the air and the hydrogen may be derived from coal or natural gas, of which there are cheap supplies near the locations of both the prewar plants and the ones built within the past three years. A prominent feature of fertilizer production is the utilization of by-product ammonia produced from the coking of coal, present production of which is running in excess of 160,000 tons of nitrogen per year.

United States exports of nitrogenous materials have been exceedingly widespread—countries of destination increasing from 39 in 1929 to 63 in 1937 and 65 in 1939. In 1940, exports of nitrogenous materials amounted to $11,000,000, compared with annual average exports of $6,200,000 during the 1929–41 period. Even though world production of nitrogen has increased, the need for nitrogenous fertilizers in all countries after the war will be greater than ever before, and the United States will be able to share in supplying this expanded demand.

Potash

Potash is another of the three constituents which together or apart comprise the commercial value of fertilizers. Its source, largely mineral, is analogous to phosphate rock in that respect, but contrary as to foreign trade in that, until recent years, most of the potash used in the United States was imported. Through coordinated efforts of Government and private agencies, the United States has attained self-sufficiency in potash and ended definitely its dependence on foreign supplies.

In the earlier years the potash industry supplied up to 70 per cent of the expanding domestic needs, and during 1940 produced all grades of salts in quantities ample to supplement dwindling receipts from foreign sources. Receipts of potash from German and French sources virtually ceased immediately after the outbreak of hostilities in September, 1939. Since then the United States potash industry has been able to meet all domestic demands and have a surplus for export.

Potash exported as potash-fertilizer materials averaged $2,100,000 during the period 1929–41. The number of countries of destination increased from 12 in 1929 to 32 in 1941. Exports of salts reached their maximum of 125,300 tons in 1939, when they were abruptly terminated by the producers with diversion of the tonnage into the domestic market.

Competition for postwar foreign markets for potash will be met from Germany, France, Spain, Palestine, and Poland—countries which have been prominent exporters in the past. Substantial deposits now known to exist in U. S. S. R. undoubtedly will place that country also among the leading exporters. The United States potash industry is favored by the existence in New Mexico of mineral salts with an average potash content higher than that of the leading European sources.

Complete Fertilizers

As indicated in the foregoing discussion, the mining and processing of phosphate rock to produce superphosphate is an integral

Fertilizer Machinery AND Acidulating Equipment

BATCH MIXERS — PULVERIZERS — CAGE MILLS — SCREENS — SCALES
ELEVATORS, AND ALL OTHER EQUIPMENT FOR COMPLETE PLANTS

THE UTILITY WORKS - - EAST POINT, GA.

What you do with your money can wreck you (*and your Uncle Sam*)

BUY, BUY, BUY! Foolish people are doing it, *over*doing it. But sensible folks know that with every needless purchase—or every time you patronize a black market or buy above ceiling—you do your bit to force prices up all along the line. That's the way inflation gets a boost.

IT CAN HAPPEN HERE—again! Today, with fewer goods in the stores while incomes are high, the danger of inflation is greater than ever. Inflation is always followed by depression. What can you do to head off another depression? Buy nothing you do not really—*really*—have to have . . . today.

SAVE, SAVE, SAVE! That's the way to make America good for the boys to come home to. Pay up debts, put money in life insurance, savings bank, War Bonds. Every cent you save now, helps to keep prices down—and when the war is won you'll have use for that nest egg you've laid away.

A HOME OF YOUR OWN, a better farm, a real vacation, something to retire on—these are things worth saving for. Store up your money now while prices are high. There's a time to splurge and a time to save: today, while money's coming in, is a good time—the *right* and patriotic time—to SAVE!

4 THINGS TO DO
to keep prices down
and help avoid
another depression

1. Buy only what you really need.
2. When you buy, pay no more than ceiling prices. Pay your ration points in full.
3. Keep your *own* prices down. Don't take advantage of war conditions to ask more for your labor, your services, or the goods you sell.
4. *Save.* Buy and hold all the War Bonds you can—to help pay for the war, protect *your own* future! Keep up your insurance.

A United States War message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

part of the fertilizer industry in the United States. Superphosphate is combined or mixed with nitrogen and potash materials to make complete fertilizer mixtures containing the three vital elements. Although mixed goods is the largest item of the domestic industry, it is the smallest group in value of exports classified under fertilizers. In 1939, exports of prepared and other fertilizer mixtures totaled $237,700, shipped to 33 countries. In 1941, total value rose to $889,000, and shipments went to 31 countries.

The small demand for complete fertilizers may be largely attributed to need in a given country for a single element or for only two of the three elements. It is expected, however, that some foreign markets eventually will follow the domestic pattern; that is, where one element has been supplied, a need for complete mixed goods will develop. The formulas will be in accordance with the recommendations of the agricultural experiment stations of the countries to which the goods are shipped. A study of the fertilizer postwar requirements of individual countries should repay many times the effort and expense incurred.

Conclusion

As the soils of the world lose their fertility, and as the people of the various areas devastated by war become hungry, interest in fertilizer increases.

There would be no difficulty in estimating the future of the fertilizer markets of the world if they would correspond to even the lowest subsistence levels. But people who cultivate the soil merely to feed themselves have no money with which to buy the necessary chemicals needed after soil exhaustion. Under conditions which exist at the inception of agricultural development, farms may be self-sustaining sometimes for a long period, even hundreds of years, but eventually the soil plays out and it becomes necessary to purchase plant food.

Some of the principal United States fertilizer producers expect what they call an "enormous foreign market." Many foreign countries will be able to finance wholly or partly their extraordinary requirements of United States goods after the war. This will include most of the Latin-American and several European countries which built up large dollar holdings. But other countries, including several of the Allies and probably all the enemy countries, may require assistance in paying for their relief needs. Countries which may need assistance have been among the best customers for fertilizers from the United States.

European dislocations affecting present production in plants which have escaped damage, and the destruction of other plants, have reduced the fertilizer supplies to below minimum requirements. Countries have been unable to import phosphates. War has reduced the available quantity not only of phosphates, but of all the essential elements necessary for the production of crops.

Indiana Corn Champion

Alfred Bartelt, Dubois County, Indiana, was the 1944 Indiana corn champion grower, with 163.8 bushels per acre average. All of the ten highest producers used fertilizers in hills or rows, and in four cases 400 to 1,500 pounds per acre were plowed under.

Top-dress Small Grains Early

"For best yields, small grains in most sections of North Carolina should be top-dressed between February 1st and March 15th," says W. H. Rankin, agronomist of the North Carolina Agricultural Experiment Station at State College, Raleigh.

Through the years, tests have shown that late application of top dressing after April has resulted in lower yields than where the same amount of top dressing was applied at an earlier date, according to Rankin. He reports that under average conditions early top dressing with 16 pounds of nitrogen per acre gave an increase of about 8 bushels of wheat, for example, while late top dressing gave only 3 bushels increase.

Rankin recommends from 16 to 32 pounds of nitrogen per acre and extra potash along with the nitrogen where heavy crops of legume have has been removed.

BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

AMMONIA—Anhydrous and Liquor
Barrett Division, The, Allied Chemical & Dye Corp., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.
Nitrogen Products, Inc., New York City

AMMONIUM NITRATE SOLUTIONS
Barrett Division, The, Allied Chemical & Dye Corp., New York City.

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Bemis Bro. Bag Co., St. Louis, Mo.
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BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.

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Hollingshurst & Co., Inc., New York City
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Keim, Samuel D., Philadelphia, Pa.
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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BUCKETS—For Hoists, Cranes, etc.
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CARBONATE OF AMMONIA
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DuPont de Nemours & Co., E. I., Wilmington, Del.

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Wiley & Company, Baltimore, Md.

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Phosphate Mining Co., The, New York City.

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International Minerals and Chemical Corporation, Chicago, Ill.
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U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

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Utility Works, The, East Point, Ga.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

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Utility Works, The, East Point, Ga.

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Barrett Division, The, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.

NITRATE OF SODA—Continued
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Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Phosphate Mining Co., The, New York City.
Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Wellmann, William E., Baltimore, Md.

PLANT CONSTRUCTION—Fertilizer and Acid
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Tennessee Corporation, Atlanta, Ga.

Alphabetical List of Advertisers

American Agricultural Chemical Co., New York City. 3
American Limestone Co., Knoxville, Tenn.....20
American Potash and Chemical Corp., New York City.....4, 27
Armour Fertilizer Works, Atlanta, Ga..... 5
Ashcraft-Wilkinson Co., Atlanta, Ga.....Front Cover
Barrett Division, Allied Chemical & Dye Corporation, New York City.....—
Bemis Bro. Bag Co., St. Louis, Mo.....21
Bradley & Baker, New York City.....16
Chemical Construction Corp., New Corp City.....—
Du Pont de Nemours & Co., E. I., Wilmington, Del..25
Fulton Bag & Cotton Mills, Atlanta, Ga..... 6
Gascoyne & Co., Inc., Baltimore, Md.....34
Hayward Company, The, New York City.....34
Huber Co., L. W., New York City.....24
Hydrocarbon Products Co., New York City.....19
International Minerals & Chemical Corporation, Chicago, Ill.....23
Keim, Samuel D., Philadelphia, Pa.....33
McIver & Son, Alex. M., Charleston, S. C.....27
Mente & Co., Inc., New Orleans, La.....—
Monarch Mfg. Works, Inc., Philadelphia, Pa.....34
Nitrogen Products, Inc., New York City.....26
Phosphate Mining Co., The, New York City..... 4
Polk Co., R. L., Detroit, Mich.....—
Potash Co. of America, New York City....3rd Cover
Raymond Bag Co., Middletown, Ohio.....18
Ruhm, H. D., Columbia, Tenn.....34
Sackett & Sons Co., The A. J., Baltimore, Md.....30
Schmaltz, Jos. H., Chicago, Ill.....34
Shuey & Company, Inc., Savannah, Ga.....34
Southern Phosphate Corp., New York City.....—
Stedman's Foundry and Machine Works, Aurora, Ind.....22
Stillwell & Gladding, New York City.....34
St. Regis Paper Co., New York City.....Back Cover
Tennessee Corporation, Atlanta, Ga.....—
Texas Gulf Sulphur Co., New York City.....—
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.....27
United States Potash Co., New York City...2nd Cover
Utility Works, The, East Point, Ga.....28
Wiley & Company, Inc., Baltimore, Md.....34

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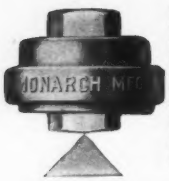

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